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Success Story

MULTI-LANE TRAFFIC MONITORING SENSOR EASES ROADWAY SAFETY CONCERNS

The Multi-Lane Traffic Monitoring Sensor (MTMS), a low-cost, nonintrusive, lane-monitoring sensor that measures and classifies vehicular traffic over multiple lane roadways, will help eliminate roadway installation safety concerns. This sensor permits portable or permanent setup on the roadway berm without costly construction, maintenance, traffic disruptions, or hazardous situations for highway personnel. It also provides for growth to meet advanced requirements for the Federal Highway Administration and the Ohio Department of Transportation (ODOT). Numerous departments of transportation, including Minnesota, Florida, and Hawaii, are expressing keen interest in this traffic sensor technology.

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Accomplishment

The MTMS represents a major achievement in traffic engineering through portability, low cost, easy setup, and elimination of hazards to motorists and highway maintenance personnel. Traffic engineers can safely install the remote traffic monitoring sensor on the side of the road without disturbing traffic. This low-cost system collects data and monitors traffic at remote locations. Information Directorate engineers designed and developed this sensor using existing aerospace technologies. MTMS uses dual-beam lasers to detect vehicles under various highway conditions and then processes and stores the signals for later traffic analysis. The unit is portable, self-contained, and nonintrusive to the roadway. Safety to technicians and motorists was a primary design consideration.

Background

Current traffic monitoring systems consist of inductive loops, piezo-electric switches, and road tube sensors to record traffic counts, classify vehicle type, and gather speed data. The ODOT maintains approximately 200 permanent induction loop/piezo-electric switch systems and collects approximately 3,750 portable road tube counts per year.

Traffic engineers recommend installing permanent sensors while constructing a highway, however, they can install the sensors later at a much greater expense. ODOT workers replace the monitoring sensors at a permanent installation site at additional cost when making major road repairs.

ODOT expressed a need for a low-cost, nonintrusive traffic monitoring sensor that is safe to install. The essential requirements included classifying the vehicle type by lane, monitoring one to four lanes of traffic simultaneously, and measuring vehicle velocity within ± 1%. Additional requirements included packaging each system as a self-contained portable unit that can be erected in less than 30 minutes, operating over a continuous 48-hour cycle, and exhibiting the capability to communicate electronically from remote sites. This sensor also meets the requirements of interfacing to existing traffic monitoring system boxes for data processing and occlusion prevention, which is the simultaneous tripping of the laser beam or the blocking of one vehicle tire by the tire of another vehicle.

Information
Technology Transfer

Additional information

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